Internet of Services

Project Introduction

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Service-centric Networking
Telekom Innovation Laboratories and TU Berlin

Our chair

Prof. Dr. Axel Küpper

Research

- Mobile Computing
- Context-aware Computing
- Green ICT
- Cloud Computing
- Online Social Networks
- Semantic Web & Linked Data

Have a look at open theses & job opportunities

Teaching

- IoSP (ST/WT)
- Web Technologies (WT)
- Electronic Commerce (WT)
- Digital Communities (WT)
- Mobile Services (ST)
- Geschäftsprozesse und IT-Dienste (ST)

The IOSP

The IoSP

1. Research & Implementation
2. Project Management & Documentation
3. Presentation

Research & Implementation

- Project teamwork (2-4 students)
- Regular supervision
  - Talk to your supervisor right after this meeting!
  - Contact early and often!
- Workload
  - 9 ECTS (approx. 6 SWS) in 15 weeks
  - 15 – 18 hours per person per week
    - » (Realistic: 10 – 15 hours)
- Time distribution recommendation:
  - 1/3: research — conceptual work — planning
  - 2/3: implementation — practical work — doing
- Redmine (SVN/GIT, wiki, ticketing system, etc.)
  - Register @ https://project.snet.tu-berlin.de

Project Management

Plan

- Tasks, responsibilities and estimated workload

Track

- Time spent
- Update plan as neccesary

Compare

- Plan and actual data

Documentation

- Highly dependent on topic
- Est. 20 – 30 pages
- Sebastian G will hand out a Latex template
- Due dates
  - 13th of January: Preliminary documentation
    - Includes research, concept and work planning
  - 17th of February: Final documentation
    - Implementation overview, plan/actual comparison, etc.

Presentation

1. Intermediate presentation
   - January 6th, 1300 – 1700, Room SG-04 505
   - 15 minutes presentation + 5 minutes Q&A
2. Final presentation
   - February 10th, 1300 – 1700, Room SG-04 505
   - 20 minutes presentation + 10 minutes Q&A

Attendance is mandatory.

Assesment

- 50% implementation
  - Code, Concept, Design, Architecture, Demo
- 30% documentation
  - Related work, actual documentation, evaluation
- 20% presentation
  - Slides & performance
  - Every participant has to present
  - Mind the nine recommendations

Nine recommendations for good presentations

Recommendation 1

Do not read your slides

Recommendation 2

Focus on a **clear** and **meaningful** message

Recommendation 3

Rule of three:

Three sections

Three main points

Three main results

http://www.forbes.com/sites/carminegallo/2012/07/02/thomas-jefferson-steve-jobs-and-the-rule-of-3

Recommendation 4

Practice **beforehand**.

Multiple times.

Refine.

Recommendation 5

Less text,

more graphics

Recommendation 6

No

Recommendation 6

bullet

Recommendation 6

point

Recommendation 6

lists.

Recommendation 6

Slides

Recommendation 6

are

Recommendation 6

free!

Recommendation 7

Slides are *visual aides*.

You don’t have to talk
if you only read them aloud.

Recommendation 8

Mind the rhythm

Blablablablablablablablablablablabl
ablablablablablablablablablablabla
blablablablablablablablablablablabl

„Thank you for your attention!“

Recommendation 9

Use standard notations.

(UML, BPMN, etc.)

Project topics

Project Topics & Supervisors

1. **P2P-based Social DNS**
   – Sebastian Göndör
2. **OpenMobileNetwork Location Provider**
   – Abdulbaki Uzun, Moritz von Hoffen
3. **Linked Crowdsourced Data and Location Analytics in the OpenMobileNetwork**
   – Abdulbaki Uzun, Moritz von Hoffen

Topic 1: P2P-based Social DNS

- How to create a globally unique identifier for social profiles?

- Normally, you get to choose a name in an OSN such as yourname@osndomain.org
  - This is globally unique because of the domain “osndomain.org”
    - (iff yourname is unique within the web service’s context)

Topic 1: P2P-based Social DNS

- But what if there is a system that allows for migration of social profiles between hosts?
  - Trivial solution: HTTP Redirect / Change of identifier
  - Problem:
    - A redirect requires cooperation with the owner of the domain
    - A change of the identifier might result in dead links
  - WebID addresses this problem by providing profile information at a well known URL
    - User has to maintain a domain by himself or rely on a service provider
- An alternative approach would be to build a social DNS based on p2p-technology

Topic 1: P2P-based Social DNS

- Problem:
  - If you let each person choose a (globally unique) pseudonym, it will soon be difficult to find a suitable one, that people can actually remember
    - See: Email adresses, pseudonyms on the web, …
- So: How to identify an individual globally?

Topic 1: P2P-based Social DNS

- Individuals can be identified by various features such as name, DOB, phone number, …
- While some of those features are globally unique, only few are permanent. Most features will change more or less frequently
  - E.g.
    - Phone number: is globally unique, but may change frequently
    - DOB: is not unique, but is permanent

- Solution: A set of semi-unique, well-known identifiers might be globally unique AND somehow permanent
  - E.g.: First name + middle name + last name + DOB + nationality
  - Your last name or nationality might change once or twice in your lifetime
  - …there might be other approaches…

Topic 1: P2P-based Social DNS

- Tasks:
  - Build a social DNS using P2P technology
  - Create a scheme for globally unique identifiers
  - Use PublicKey cryptography to sign/verify the managed datasets

- You need to…

  …be experienced in programming on a rather low-level (system and network programming)

  …have basic knowledge of p2p overlay systems

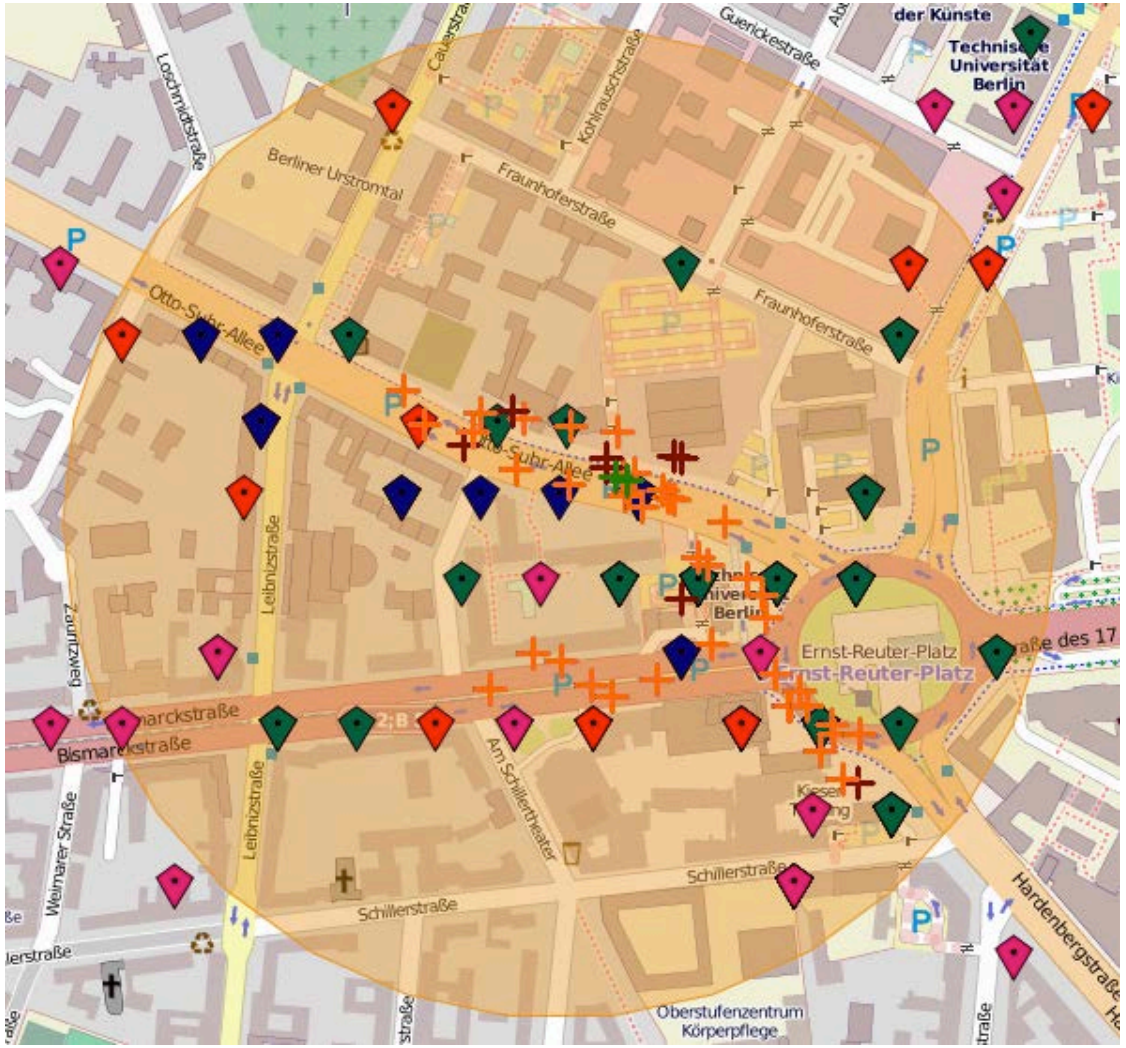
  …be willing to research and adopt the required standards and protocols

Topic 2
OpenMobileNetwork Location Provider

- OpenMobileNetwork Location Provider

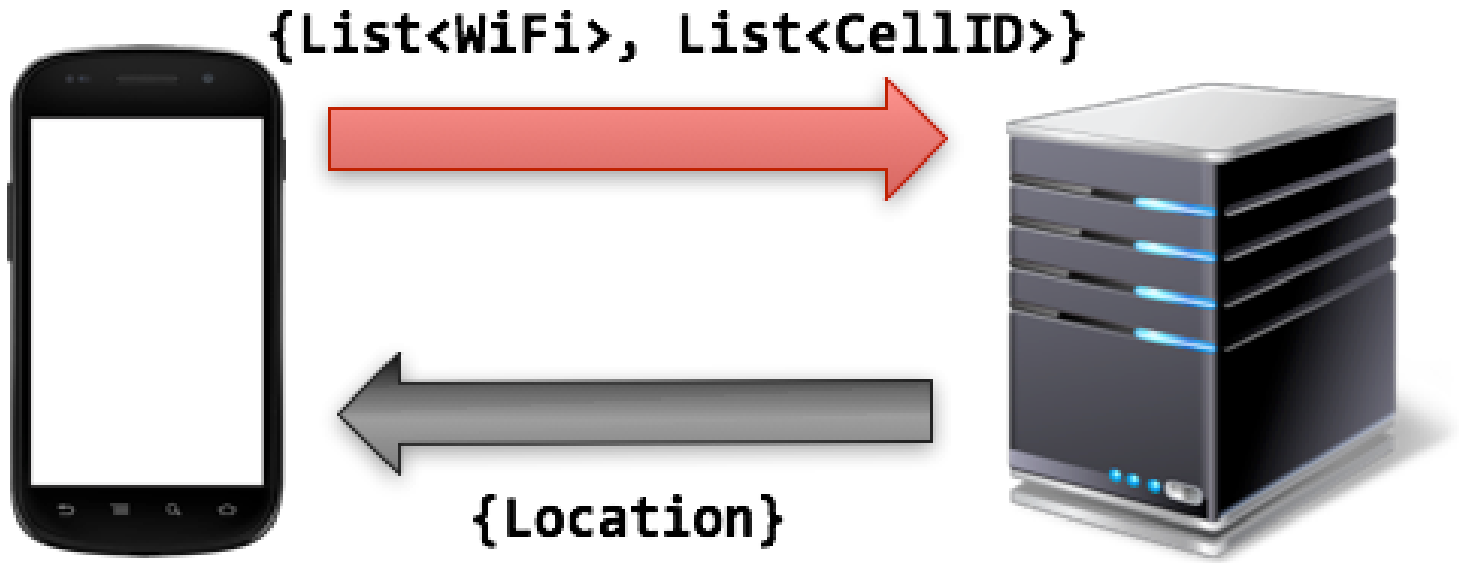
Topic 2
OpenMobileNetwork Location Provider

- The OpenMobileNetwork (OMN) is a Live **Crowdsourcing** Platform
- An **Android App** installable on smartphones conducts measurements every 15s
- Each measurement includes **cell ids, visible wifi access points** and **GPS coordinates** (among other information)
- Current stats: Over **2K users** contributed measurements comprising roughly **240K cells** and **1.25M WiFi APs**



Topic 2
OpenMobileNetwork Location Provider

- Leverage this data to enable a standards-compliant **OMN Location Provider** *purely* based on **cellular** and **WiFi** reception

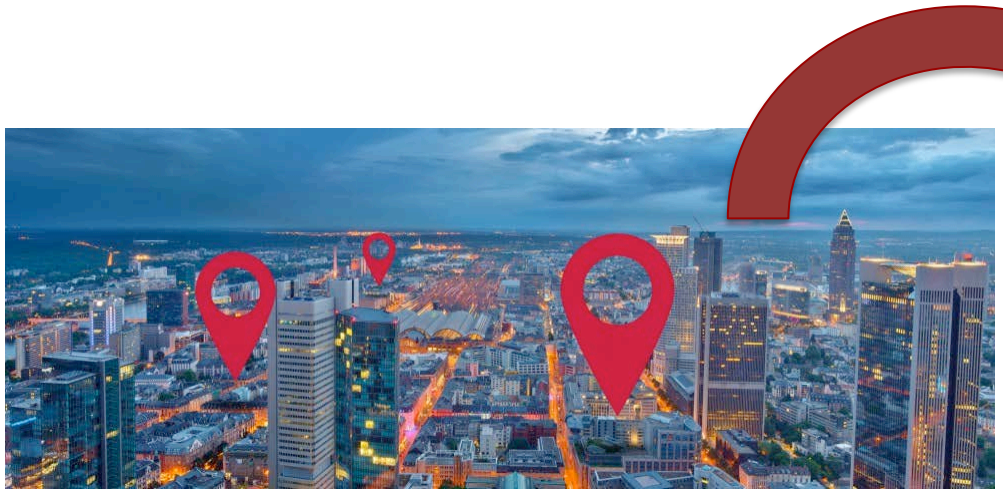


Topic 2
OpenMobileNetwork Location Provider

- Tasks
  - Study state of the art technologies and standards, e.g. **SUPL**, **GIS**, and **trilateration & lateration algorithms**
  - Investigate the existing data and evaluate/compare different **Geolocation methodologies**
  - Set up and evaluate the OMN Location Provider
  - Design and implement Android client to showcase the result
- Requirements
  - Proficiency in object oriented programming languages (preferably Java)
  - Knowledge of web and data base technologies
  - Interest in Android programming is a benefit

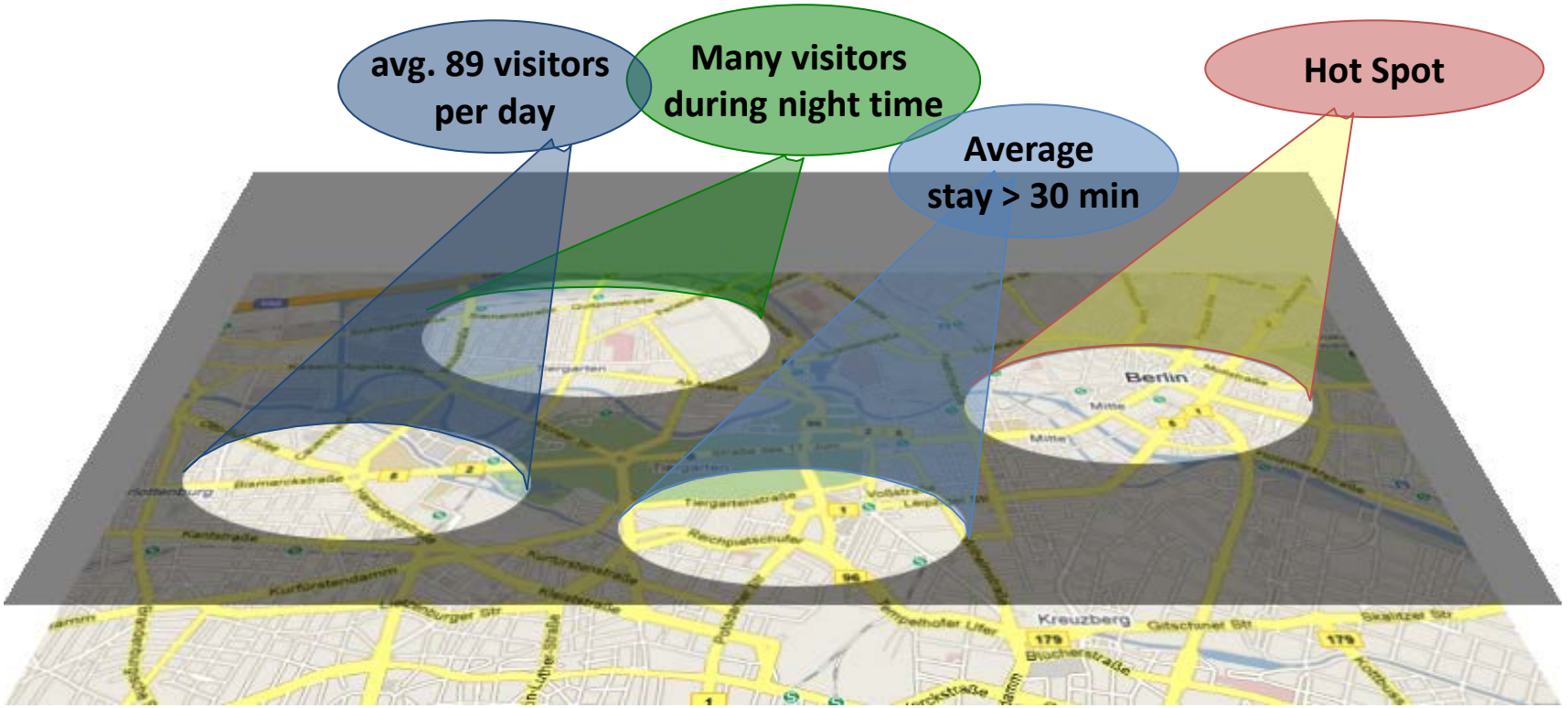
Topic 3
Linked Crowdsourced Data and Location Analytics in the OMN

- Linked Crowdsourced Data and Location Analytics in the OpenMobileNetwork



Topic 3
Linked Crowdsourced Data and Location Analytics in the OMN

- **Location Analytics** provide insight on *vicinites/areas* by incorporating information including details about nearby POIs and movements of people



Topic 3
Linked Crowdsourced Data and Location Analytics in the OMN

- Explore existing data from OMN for **user paths** and **augment** with external data (such as *weather*, *time of day*, and *Points of Interest* nearby) to identify different types of "*hot spots*"

- Let users contribute **ratings**, **tags** and **publish** new POIs via **app**

Topic 3
Linked Crowdsourced Data and Location Analytics in the OMN

- Tasks
  - Research in the field of Linked Data and methodologies of Location-based Services and Location Analytics
  - Analyze existing data and develop a analytical functionalities
  - Develop a platform enabling users to publish new POIs and rate or tag existing POIs via an Android app
    - Make data available in an Linked Open Data fashion
    - Utilize data to conduct Location Analytics
  - Develop a Location Analytics dashboard visualizing the results

- Requirements
  - Interest in the field of Location-based Services (LBS) and Location Analytics
  - Interest in the field of Linked Data (RDF, ontologies, SPARQL)
  - Java and/or Android development
  - Know-how of databases and (possibly) data mining

Contact information

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